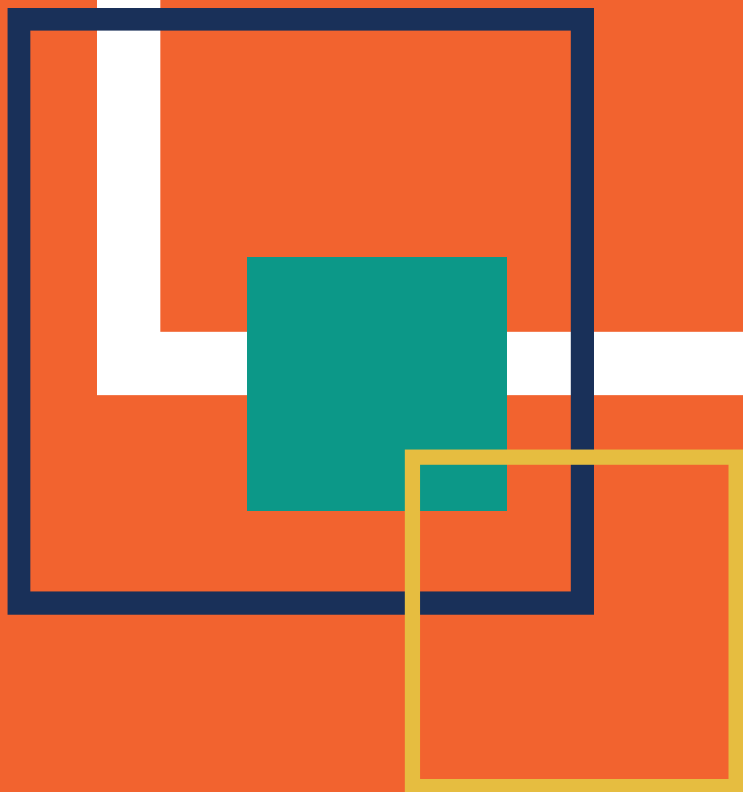# #conmonunpacked

The Condition Monitoring Approach

1. Online approach

2. Offline approach

3. Choosing a strategic path

4. Benefits and pitfalls

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1. Online approach

Online monitoring is typically used for critical equipment or machinery where downtime or failure could significantly impact operations.

Online asset monitoring is designed for routine data collection safely and predictably, whether periodic or continuous. It allows for data collection continuously, and any anomalies or deviations from normal behaviour can be quickly identified and acted upon so that proactive maintenance can occur.

Online condition monitoring can be undertaken in three ways:

Irregular and occasional condition assessments - a snapshot of the asset condition at a point in time.

Regular periodic condition assessments - results are compared over time to obtain a trend of asset condition.

Continuous condition monitoring in realtime - requires permanently installed sensors and monitoring systems.

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2. Offline approach

Offline monitoring is typically used for less critical equipment or machinery, where the cost of continuous monitoring may not be justified.

Offline asset monitoring is always periodic and involves taking equipment out of service for test interventions and inspections, typically during scheduled maintenance. It may include taking measurements or performing tests to identify any changes in the condition of the equipment, such as wear or degradation.

Sometimes, an offline approach may be better than an online approach. For example, when cost is a factor, offline monitoring can be done with more basic equipment and be performed manually, reducing the cost of the monitoring process and making it more accessible for smaller organisations with limited resources.

It is essential to carefully consider the specific needs of the equipment and the monitoring goals before deciding on an approach.

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3. Choosing a strategic path

Consider what is specific to the asset and develop a condition monitoring strategy that is tailored to the needs of the asset and organisation.

When choosing a strategic path for a component or system, firstly consider:

- What is the mode of failure?
- Which component/s of the asset warrant monitoring?
- Which parameters must be monitored?

Secondly, determine the following:

- Cost (device cost, lifecycle cost, reliability)
- Data (what must be gathered and who will analyse it)
- Infrastucture (personnel required, and does it need specialist support)
- Communications (how will the data be transmitted and who needs to see it)

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3. Choosing a strategic path

Circumstances will dictate which condition monitoring approach is the most appropriate.

An example of a critical power transformer illustrates different approaches according to the asset's condition:

New transformer in good health:

The asset heath is good and a failure is not expected - offline periodic.

Aged transformer but defect free: The asset is aged but its condition is still good - online periodic.

Aged transformer with a defect: The asset health is bad, and the asset's condition is defective - online continuous.

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4. Benefits and pitfalls

The expected ROI cannot be realised if the technologies are not used appropriately and to their full potential.

Organisations can realise significant benefits from condition monitoring of their critical assets:

- Plan and schedule corrective action timeously (spare parts, materials and special resources).

- Conduct appropriate maintenance (plan what needs to be done by who, when and where).

- Eliminate defects that would result in failure (feedback, keep history, analyse failure data).

- Targeted maintenance (smart and efficient, least amount of downtime).

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4. Benefits and pitfalls

A combination of preventive maintenance tactics is required to maintain critical assets best.

Organisation should carefully weigh the costs and potential pitfalls before implementing a programme. Common pitfalls:

- Expecting too much too quickly.

- Applying condition monitoring - but not acting on it.

- Too much data!

- Resources are not trained on CM technologies and/or on how to interpret the data.

- Selecting the incorrect technology.

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